



# Engineering Staff College of India

Autonomous Organ of The Institution of Engineers (India)

Old Bombay Road, Gachibowli, Hyderabad – 500 032.TS, India



**Management and Technology Division**

## Continuing Professional Development Programme on *Advanced Metrology for Precision Industries* (With Practical Demonstrations)

05 - 07 February 2019



(An ISO 9001:2015 Certified, AICTE & CEA Recognized Institution)

**Centre for Promotion of Professional Excellence**

## INTRODUCTION

Metrology refers to the science of measurement. It covers seven base units, namely Mass, Length, Time, Temperature, electric Current, Amount of Substance and Luminous Intensity. Three main areas of metrology cover: Scientific or fundamental Metrology, Applied or Industrial Metrology and Legal Metrology. Metrology influences, drives and underpins much of what we do and experience in our everyday lives, though often unseen. Industry, trade, regulation, legislation, quality of life, science and innovation all rely on metrology to some extent. In today's world, it has become necessary to have the basic understanding of Metrology.

Understanding and application of Industrial Metrology assumes high importance as the Industry is progressing to high precision accuracy and automation at a very fast pace. Comparison and measurement against the intended dimensions and standards have led to many advances in the Measurement Technologies.

The present program aims at creating the knowledge base and engineering application for practicing personnel and managers in the field of Precision Engineering.

## OBJECTIVES

The objective of the course is to impart thorough understanding of Dimensional Metrology techniques and intricacies in measurements in industrial environment. Advancement in Dimensional Measurement will be complemented by adequate coverage of standard existing techniques.

## COURSE COVERAGE:

### Introduction to Metrology and Historical Background

#### Basic Definitions:

- Units and Dimensions
- Standard Length Unit
- Limits Fits and Tolerances
- Geometric Dimensioning and Tolerancing System (GD&T)
- Accuracy and Precision/ Repeatability

#### Engineering Parameters:

- Linear Dimensions
- Form and
- Finish

#### International and National Standards

#### Conventional Measurement Techniques

### Three Dimensional Measurements and Equipment

- Elements of 3-D Measurement Systems: Scales, Probes, Trigger and Software systems
- 3-D Measurement
- Form and Curvature Measurement
- Common Mistakes Made in Measurement
- Good Practices
- Application of 3-D Measurement in General Precision, Aerospace–Defence and Automobile Industries

### Optical and LASER Measurement Systems Calibration Systems and Techniques

- Standard Gauges and their Application
- Optical/LASER Calibration Systems

### Practical demonstration

- Prestigious Lab/organisation/Industry

## METHODOLOGY

Methodology of the programme includes class room Sessions with Lecture/discussion with audio visual aid, benched marked video shows, Chalk & Talk sessions, group discussions, case studies, debates, sharing of experiences, etc. All the sessions will be interactive demanding active participation from all the members. CMI will be the main method of instruction.

## COURSE ADVISOR& RESOURCE PERSON:



**Mr. Surendra Kumar**  
Former Lab Director and  
Outstanding Scientist –Armament  
Res & Dev Establishment, Pune  
(A DRDO Systems Lab)

**Mr. VK Nayyar**  
Former Sc G  
DRDL, DRDO Lab

**Mr. B. Hari Prasad,**  
Expert in Metrology  
With over 26 Years of Experience

## FACULTY:

The faculty consists of experts from industry, research establishments and academia besides that from ESCI.

## TARGET PARTICIPANTS

- Engineers from Mechanical, Automobile, Aerospace and Defence Industries
- Quality Control and Quality Assurance Engineers and Professionals
- Engineers from Shop floor, Design, Manufacturing, Testing and Quality Assurance agencies
- Personnel from Research and Development, Manufacturing, Production and Maintenance set ups
- Scientists working in Research Laboratories, Engineers and Professionals from Governments, Private sector and Public Sector Undertakings (from product, process and service sectors), and Professors of various NIT's, Universities and Engineering colleges will find the programme useful.

## BENEFIT TO THE PARTICIPANTS:

The participants will be benefited with deeper knowledge of Metrology and its application in the field of Engineering, Manufacturing and Quality control processes. The course will facilitate understanding of correct and good practices and help avoid common mistakes made in precision measurement practices. Exposure to variety of instruments & equipment and advances in the field of measurement and calibration would add value to the organisation through its participants of the course.

## PROGRAMME VENUE, DATES & TIMINGS

**Venue:** Engineering Staff College of India (ESCI) Campus, Old Bombay Road, Gachibowli, Hyderabad. 500032. TS, India.

### Dates

**05 - 07 February 2019**

### Timings

On the first day Registration will commence at 0900 h. On all other days the programme timings will be from 09.45-17.15 Hrs with breaks in between for tea and lunch.

## COURSE DIRECTOR



**Gp Capt (Retd) BS Phillora** BE (ETC), AE (L), MMS (DS), M Phil, FIE  
Dean of Studies ESCI &  
Sr. Faculty, Management & Technology Division, ESCI

## COURSE FEE

₹ 15,500/- (**Residential Fee**) per participant. Fee includes, course material, course kit, twin-sharing/single AC accommodation as per availability, breakfast, lunch, dinner, tea / coffee and snacks during the actual days of training programme.

## DISCOUNTS:

- ❖ **Non-Residential Fee:** 10% discount on course fee is allowed for non-residential participants.
- ❖ **Group Discount:** Additional 10% discount for three or more participants, if sponsored by the same organization.

**(All discounts are applicable only if fee is received at ESCI before the commencement of the programme.)**

**Goods and Service Tax @ 18%** is to be paid extra over and above the training fee. PAN Card No AAATT3439Q; **GST No. 36AAATT3439Q1ZV.** (Under commercial training or coaching services).

Programme fee is to be paid in favour of "IE (I)-Engineering Staff College of India" in the form of demand draft payable at Hyderabad at par cheques payable at any Bank Branches.

Alternatively, the payment may be made by Electronic Fund Transfer (EFT) to ESCI - **SB A/c No.0432104000039631 with The IDBI Bank Ltd., Gachibowli Branch, Plot No. 2-53/2, JNIBF, IIIT Junction, Gachibowli, Hyderabad-500032 by RTG's/ NIFT / IFSC Code No: IBKL0000432. ESCI PAN No. is AAATT3439Q.** While using EFT/ Draft method of payment, kindly forward a covering letter giving details on the names of the participants, Title and the programme schedule so that proper accounting can be done.

## REGISTRATION:

Online registration shall be available on ESCI website. ([URL:www.escihyd.Org](http://www.escihyd.Org))

To register, manually please send your nominations giving details of name, designation, contact address, email address, mobiles no, telephone and fax number of the participant along with the details of mode of payment of fee, addressed to:

**Head, Management & Technology Division**

Engineering Staff College of India

Old Bombay Road, Gachibowli, Hyderabad 500 032, TS, India

**Phone:** Direct 040 6630 4111 & 6630 4112 & 6630 4105**Fax :** 040-66304103 & 9140309935227**Email:** [mt@escihyd.org](mailto:mt@escihyd.org),**For Registration Please Contact:**

Mr. LV Rao

Programme Manager,

Land line 040 66304105

Mob: 0 9949145865

**CERTIFICATION****A certificate of participation will be awarded to each participant on conclusion of the programme.****GENERAL INSTRUCTIONS:**

- ESCI encourages participants to present case studies from their respective organizations.
- For the convenience of outstation participants, ESCI will facilitate pick-up and drop from Airport / Railway Stations / Bus Stations, if travel plans are received at least 3 days in advance along with mobile number by fax or email. The charges shall be paid by the participant directly to the Cab.
- ESCI provides complimentary accommodation and boarding to the participants one day before commencement (Check-in 1200 h) and one day after conclusion (Check-out 1200 h) of the programme duration. Overstay charges will be applicable as per ESCI rules (subject to availability of accommodation)
- Well-developed Information Centre and Internet facilities are available to the participants.

**Nominating authorities are requested to kindly send the contact details of the participants while sending their nomination letter. This will help us in making necessary administrative arrangement for them.**